BOISE CASCADE (PWS 3230003; 3230051; 3230071)
SOURCE WATER ASSESSMENT REPORT

September 19, 2000

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Boise Cascade, Emmett, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Boise Cascade drinking water system consists of four wells, specifically the Regional Office well (PWS #3230071), the Plywood Plant well (PWS #3230051), and Wells #1 and #2 at the Power Plant (PWS #3230003). The Regional Office well and the Plywood Plant well have a high susceptibility to microbial contamination because of a total coliform bacteria detection in January 1995 and May 1994 respectively. It is unknown if these detections were from system contamination or from well problems. All four wells have a high susceptibility for inorganic contamination, volatile organic contamination, and synthetic organic contamination because of numerous potential contaminant sources and a high rating for the hydrologic sensitivity of the area.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Boise Cascade, source water protection activities will vary depending on the specific well, though all should focus on implementation of practices aimed at reducing the leaching of volatile organic contaminants, synthetic organic contaminants, inorganic contaminants, and microbial contaminants within the designated source water areas. Most of the designated areas are outside the direct jurisdiction of the Boise Cascade. Partnerships with state and local agencies and industry groups should be established and are critical to success. Continued vigilance in keeping the wells protected from surface flooding can also keep the potential for contamination reduced. All wells should maintain sanitary survey standards regarding wellhead protection. The Plywood Plant should continue to have bottled water on hand for drinking if the microbial contamination problems persist. Providing the Idaho Department of Environmental Quality with drillers' well logs for the Power Plant wells could help reduce the final well rankings since a lack of information caused these wells to have higher scores. Due to the time involved with the movement of groundwater, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR BOISE CASCADE, EMMETT, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for Boise Cascade is comprised of four wells. The Boise Cascade wells are non-community non-transient wells, and have three connections that serve approximately 445 people at the Power Plant wells, 150 people at the Plywood Plant, and 30 people at the Regional Office. The wells are located in Gem County, on the western side of the City of Emmett, north of the corner of W. Main St. and Cascade Road (Figure 1).

The most significant water chemistry problems recorded in the Plywood Plant and Regional office well water has been total coliform bacteria and lead and copper above the Maximum Contaminant Level (MCL). The lead and copper levels are problems associated with the distribution systems, not well related problems and as such do not affect the susceptibility analysis. However, it is unknown from where the bacteria problem may have originated. The two Power Plant wells have recorded no significant water chemistry problems, though the possibility of contamination from urban uses remains high (see potential contaminant inventory).

Defining the Zones of Contribution--Delineation

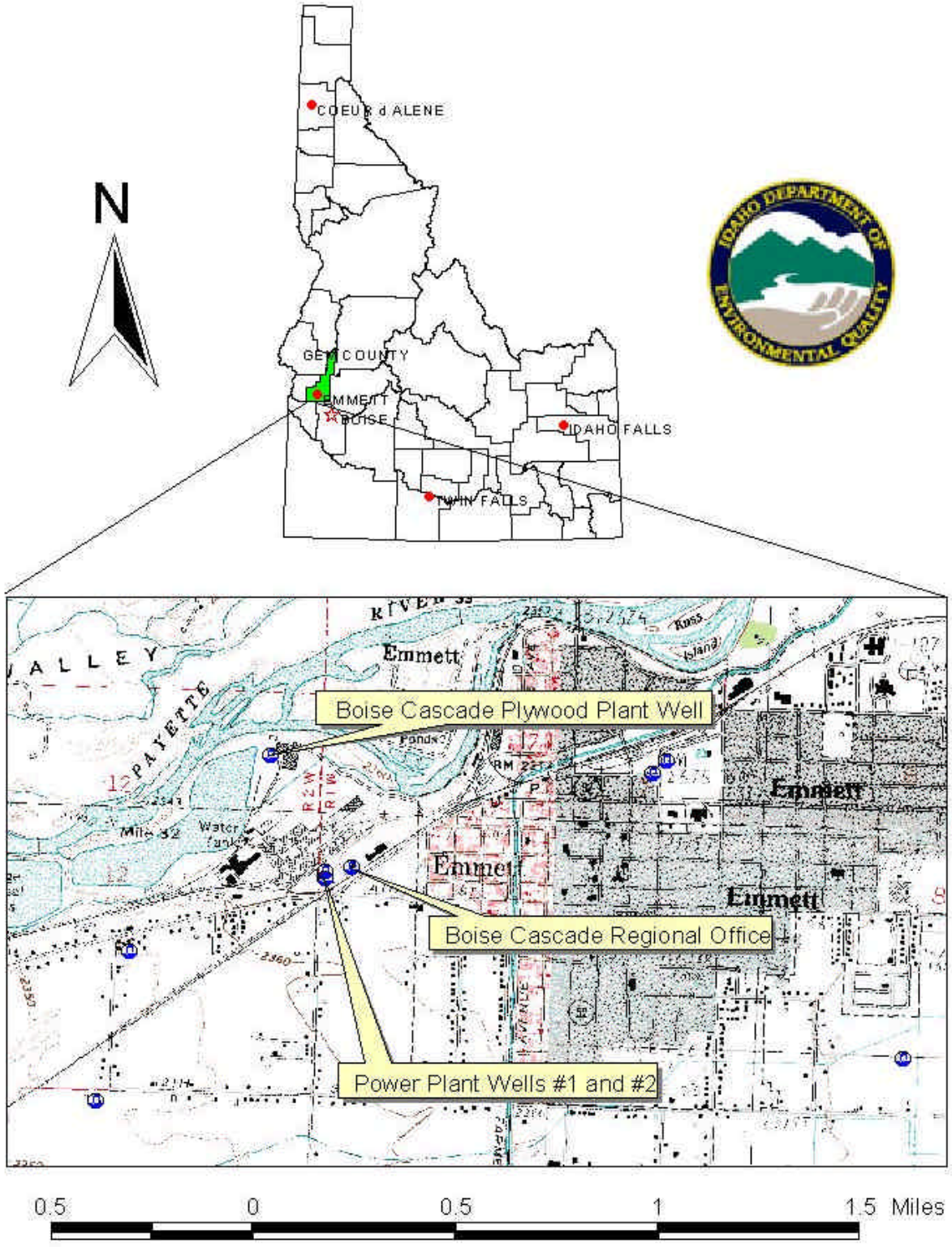
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. IDEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time of travel for water associated with the Payette Valley aquifer in the vicinity of Boise Cascade. The computer model used site specific data, assimilated by IDEQ from a variety of sources including the Boise Cascade Plywood Plant well log, Regional Office well log, and other local area well logs. The delineated source water assessment areas for Boise Cascade can best be described as corridors approximately ½ mile wide and 2 ½ miles long extending east to east-northeast through downtown Emmett with northern borders along or encompassing the Payette River. The actual data used by IDEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

The dominant land use outside the Boise Cascade area is urban and residential. Land use within the immediate area of the wellhead consists of industrial uses.

Figure 1. Geographic Location of Boise Cascade Wells



It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during June of 2000. The first phase involved identifying and documenting potential contaminant sources within the Boise Cascade Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. The second or enhanced phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Derrick Crowther.

Since the delineated source water areas encompass downtown Emmett, a number of potential contaminant sites are located within each area. The Power Plant wells have 54 potential contaminant sites (see Table 1). The Plywood Plant well has 51 potential contaminant sources (see Table 2). The Regional Office well has 37 potential contaminant sites (see Table 3). The sources include a wide variety of automotive, hardware, and printing businesses, along with businesses having underground storage tanks (USTs) and complete and incomplete leaking underground storage tank (LUST) cleanups. Additionally, there are Superfund Amendments and Reauthorization Act (SARA) sites, a Toxic Release Inventory (TRI) site, and multiple sites regulated under Resource Conservation Recovery Act (RCRA). Additionally, the Payette River floodplain and industrial waste ponds cross parts of Zone 1B, so these sources are included as additional potential sources of contamination (Figures 2, 3, 4).

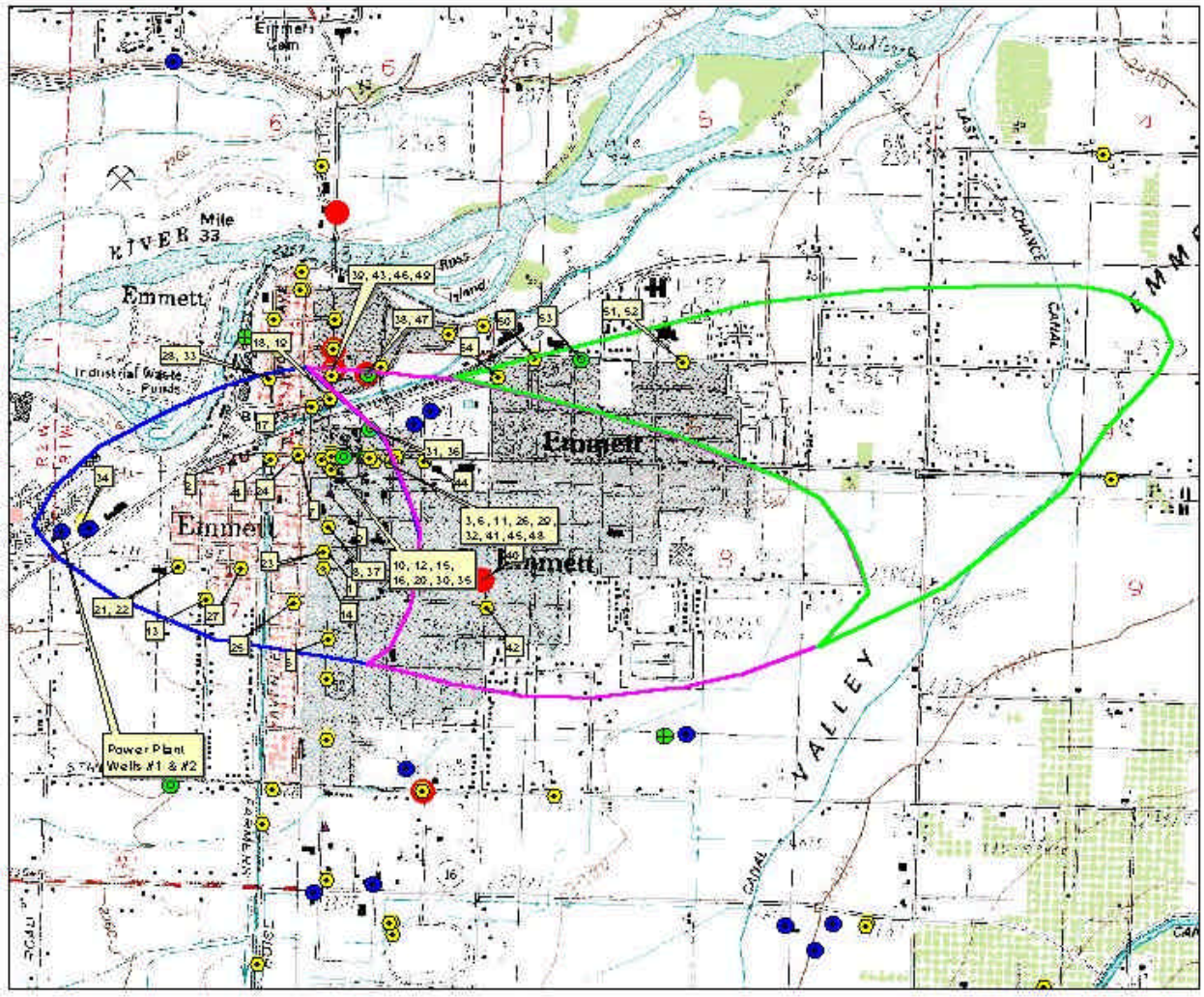
Table 1. Boise Cascade Power Plant Wells #1 & #2 Potential Contaminant Inventory

SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	UST	0-3	Database Search	VOC, SOC
2	UST	0-3	Database Search	VOC, SOC
3	UST	0-3	Database Search	VOC, SOC
4	UST	0-3	Database Search	VOC, SOC
5	UST	0-3	Database Search	VOC, SOC
6	UST	0-3	Database Search	VOC, SOC
7	UST	0-3	Database Search	VOC, SOC
8	UST	0-3	Database Search	VOC, SOC
9	UST	0-3	Database Search	VOC, SOC
10	UST	0-3	Database Search	VOC, SOC
11	UST	0-3	Database Search	VOC, SOC
12	Photographers	0-3	Database Search	IOC, VOC

Table 1. Boise Cascade Power Plant Wells #1 & #2 Potential Contaminant Inventory				
SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
13	Roofing Contractor	0-3	Database Search	IOC, VOC, SOC
14	Car Wash	0-3	Database Search	VOC, SOC
15	Hardware Retail	0-3	Database Search	IOC, VOC, SOC
16	Printing	0-3	Database Search	IOC, VOC
17	Automotive-Repair	0-3	Database Search	VOC, SOC
18	Automotive-Tires	0-3	Database Search	SOC
19	Automotive-Retail	0-3	Database Search	VOC, SOC
20	Cleaners	0-3	Database Search	VOC
21	Meat Processing	0-3	Database Search	IOC
22	Recycling Center	0-3	Database Search	VOC
23	Fire Department	0-3	Database Search	VOC, SOC
24	Railroad	0-3	Database Search	IOC, VOC, SOC
25	Photographers	0-3	Database Search	IOC, VOC
26	Automotive-Repair	0-3	Database Search	VOC, SOC
27	Concrete Contractor	0-3	Database Search	VOC, SOC
28	Feed Dealer	0-3	Database Search	IOC, SOC
29	Funeral Chapel	0-3	Database Search	IOC
30	Printing	0-3	Database Search	IOC, VOC
31	Trucking-Freight	0-3	Database Search	VOC, SOC
32	Truck Rental	0-3	Database Search	VOC, SOC
33	Hardware Manufacturer	0-3	Database Search	VOC, SOC
34	TRI	0-3	Database Search	IOC, VOC, SOC
35	RCRA	0-3	Database Search	IOC, VOC, SOC
36	RCRA	0-3	Database Search	IOC, VOC, SOC
37	SARA	0-3	Database Search	VOC, SOC
38	LUST	3-6	Database Search	VOC, SOC
39	LUST	3-6	Database Search	VOC, SOC
40	LUST	3-6	Database Search	VOC, SOC
41	UST	3-6	Database Search	VOC, SOC
42	Automotive-Wrecking	3-6	Database Search	VOC, SOC
43	Hardware-Retail	3-6	Database Search	VOC, SOC
44	Ambulance Service	3-6	Database Search	VOC, SOC
45	Automotive-Repair	3-6	Database Search	IOC, VOC, SOC
46	Engines-Gasoline	3-6	Database Search	VOC
47	Road and Bridge	3-6	Database Search	IOC, VOC, SOC
48	SARA	3-6	Database Search	VOC, SOC
49	SARA	3-6	Database Search	VOC, SOC
50	Oils-Fuel	6-10	Database Search	VOC, SOC
51	Hospital	6-10	Database Search	IOC
52	Hospital	6-10	Database Search	IOC
53	RCRA	6-10	Database Search	IOC, VOC, SOC
54	SARA	6-10	Database Search	IOC, SOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 2. Boise Cascade Power Plant Well #1 & #2
Delineation and Potential Contaminant Locations



0.5 0 0.5 1 1.5 2 Miles

Legend (see glossary)

Well Capture Zones
- Zone 1B (1-yr TOT)
- Zone 2 (5-yr TOT)
- Zone 3 (10-yr TOT)
- Wellhead
- Enhanced Inventory
- Toxic Release Inventory
- CERCLIS Site
- RICRIS Site
- Business Mailing List
- Dairy
- LUST Site

UST Site
- Closed
- Open
- NPDES Site
- Mine
- AST
- Recharge Point
- SARA Title III Site (EPCRA)
- Injection Well
- Group1 Site
- Cyanide Site
- Landfill
- Wastewater Land App.Site

N

Table 2. Boise Cascade Plywood Plant Well Potential Contaminant Inventory				
SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	UST	0-3	Database Search	VOC, SOC
2	UST	0-3	Database Search	VOC, SOC
3	Fertilizer-Manufacturer	0-3	Database Search	IOC, SOC
4	Logging Company	0-3	Database Search	VOC, SOC
5	Feed Dealer	0-3	Database Search	IOC, SOC
6	Hardware Manufacturer	0-3	Database Search	VOC, SOC
7	CERCLA	0-3	Database Search	IOC, VOC, SOC
8	SARA	0-3	Database Search	IOC, SOC
9	LUST	3-6	Database Search	VOC, SOC
10	LUST	3-6	Database Search	VOC, SOC
11	LUST	3-6	Database Search	VOC, SOC
12	UST	3-6	Database Search	VOC, SOC
13	UST	3-6	Database Search	VOC, SOC
14	UST	3-6	Database Search	VOC, SOC
15	UST	3-6	Database Search	VOC, SOC
16	UST	3-6	Database Search	VOC, SOC
17	UST	3-6	Database Search	VOC, SOC
18	UST	3-6	Database Search	VOC, SOC
19	UST	3-6	Database Search	VOC, SOC
20	UST	3-6	Database Search	IOC, VOC, SOC
21	UST	3-6	Database Search	VOC, SOC
22	UST	3-6	Database Search	VOC, SOC
23	Machine Shop	3-6	Database Search	VOC, SOC
24	Excavation Contractor	3-6	Database Search	IOC, VOC, SOC
25	Log Hauling	3-6	Database Search	VOC, SOC
26	Oils-Fuel	3-6	Database Search	VOC, SOC
27	Screen Printing	3-6	Database Search	IOC, VOC
28	Automotive-Repair	3-6	Database Search	VOC, SOC
29	Tire Dealer	3-6	Database Search	SOC
30	Automotive-Supplies	3-6	Database Search	VOC, SOC
31	Cleaners	3-6	Database Search	VOC
32	Railroad	3-6	Database Search	IOC, VOC, SOC
33	Ambulance Service	3-6	Database Search	VOC, SOC
34	Automotive-Repair	3-6	Database Search	VOC, SOC
35	Automotive-Repair	3-6	Database Search	VOC, SOC
36	Carpet Cleaners	3-6	Database Search	IOC, SOC
37	Funeral Chapel	3-6	Database Search	IOC
38	Printers	3-6	Database Search	IOC, VOC
39	Engines-Gasoline	3-6	Database Search	VOC
40	Wood Products	3-6	Database Search	IOC, SOC
41	Truck Rental	3-6	Database Search	VOC, SOC
42	Log Hauling	3-6	Database Search	VOC, SOC
43	RCRA	3-6	Database Search	IOC, VOC, SOC
44	RCRA	3-6	Database Search	IOC, VOC, SOC
45	RCRA	3-6	Database Search	IOC, VOC, SOC

Table 2. Boise Cascade Plywood Plant Well Potential Contaminant Inventory				
SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
46	RCRA	3-6	Database Search	IOC, VOC, SOC
47	SARA	3-6	Database Search	VOC, SOC
48	SARA	3-6	Database Search	IOC, SOC
49	SARA	3-6	Database Search	VOC, SOC
50	Hospital	6-10	Database Search	IOC
51	Hospital	6-10	Database Search	IOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 3. Boise Cascade Plywood Plant Well Delineation and Potential Contaminant Locations

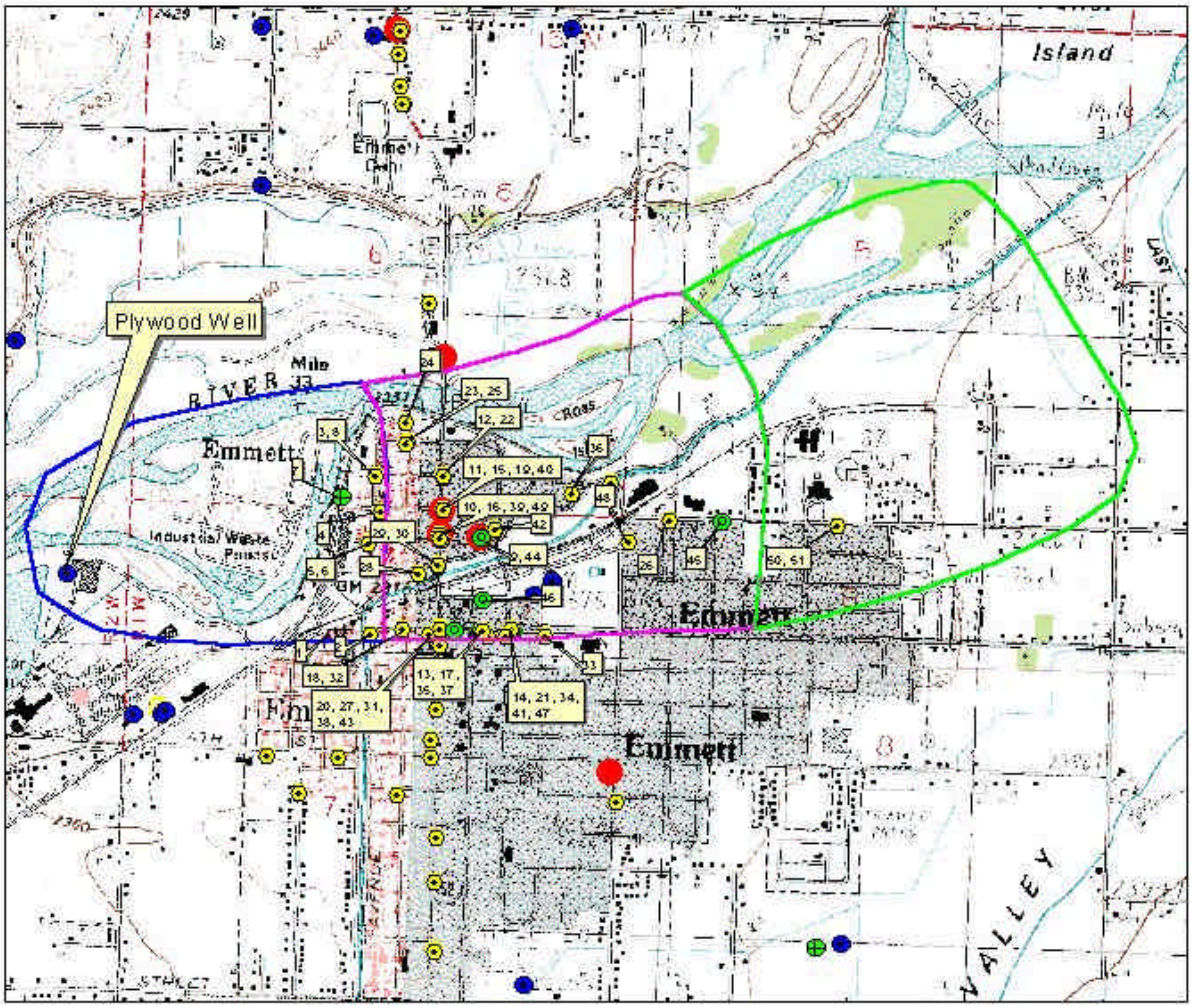
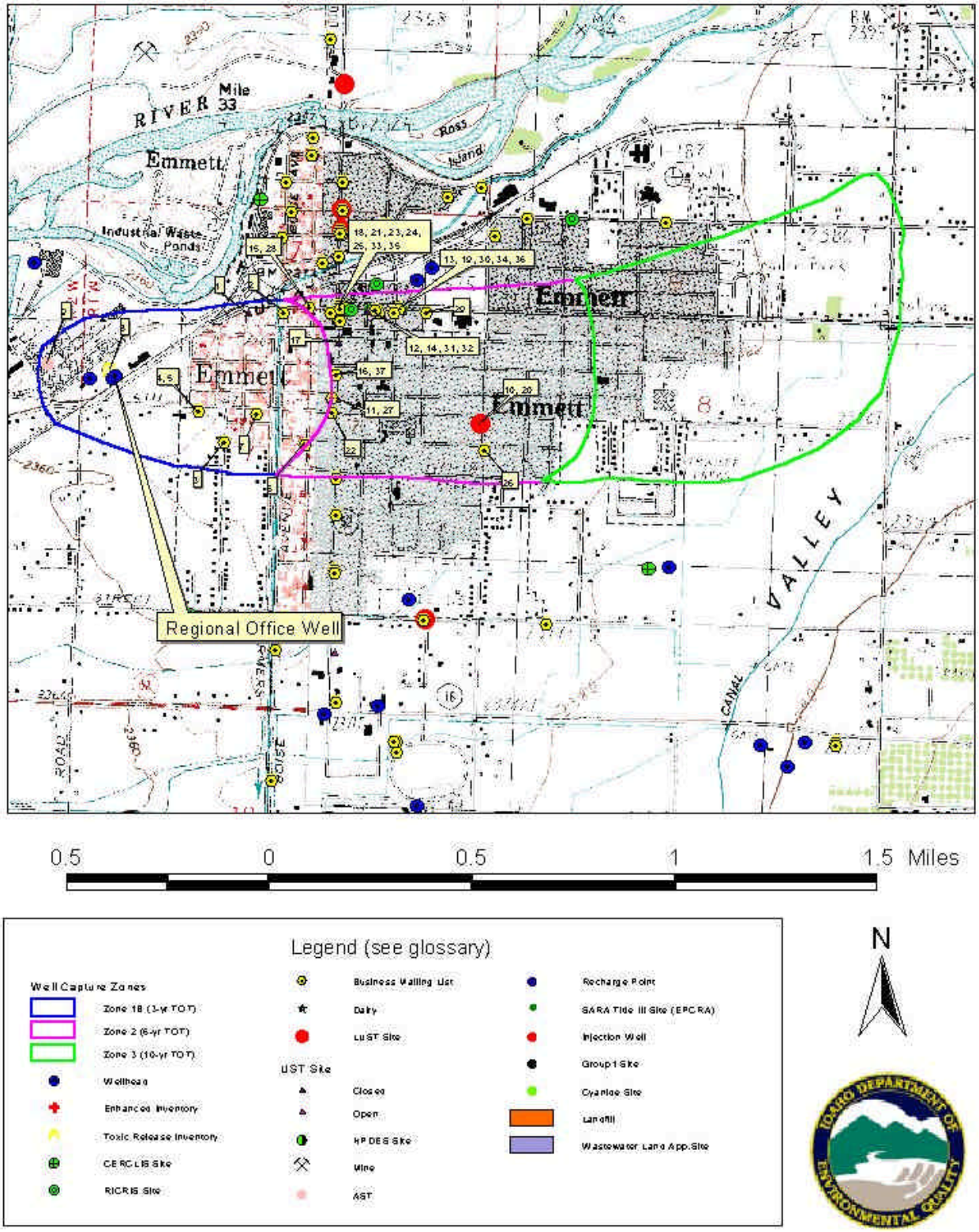


Table 3. Boise Cascade Regional Office Well Potential Contaminant Inventory				
SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	UST	0-3	Database Search	VOC, SOC
2	UST	0-3	Database Search	VOC, SOC
3	Roofing Contractor	0-3	Database Search	IOC, VOC, SOC
4	Meat Processing	0-3	Database Search	IOC
5	Recycling Center	0-3	Database Search	VOC
6	Photographers	0-3	Database Search	IOC, VOC
7	Concrete Contractor	0-3	Database Search	VOC, SOC
8	TRI	0-3	Database Search	IOC, VOC, SOC
9	Aboveground Storage Tank	0-3	Database Search	VOC, SOC
10	LUST	3-6	Database Search	VOC, SOC
11	UST	3-6	Database Search	VOC, SOC
12	UST	3-6	Database Search	VOC, SOC
13	UST	3-6	Database Search	VOC, SOC
14	UST	3-6	Database Search	VOC, SOC
15	UST	3-6	Database Search	VOC, SOC
16	UST	3-6	Database Search	VOC, SOC
17	UST	3-6	Database Search	VOC, SOC
18	UST	3-6	Database Search	IOC, VOC, SOC
19	UST	3-6	Database Search	VOC, SOC
20	UST	3-6	Database Search	VOC, SOC
21	Photographers	3-6	Database Search	IOC, VOC
22	Car Wash	3-6	Database Search	VOC, SOC
23	Hardware-Retail	3-6	Database Search	IOC, VOC, SOC
24	Screen Printing	3-6	Database Search	VOC, IOC
25	Cleaners	3-6	Database Search	VOC
26	Automotive-Wrecking	3-6	Database Search	VOC, SOC
27	Fire Department	3-6	Database Search	VOC, SOC
28	Railroad	3-6	Database Search	IOC, VOC, SOC
29	Ambulance Service	3-6	Database Search	VOC, SOC
30	Automotive-Repair	3-6	Database Search	VOC, SOC
31	Automotive-Repair	3-6	Database Search	VOC, SOC
32	Funeral Chapel	3-6	Database Search	IOC
33	Printers	3-6	Database Search	IOC, VOC
34	Trucking	3-6	Database Search	VOC, SOC
35	RCRA	3-6	Database Search	IOC, VOC, SOC
36	SARA	3-6	Database Search	VOC, SOC
37	SARA	3-6	Database Search	VOC, SOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 4. Boise Cascade Regional Office Well Delineation and Potential Contaminant Locations



Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was rated high for all four wells (see Table 4). This reflects the transmittable nature of the soils being in the moderately-drained to well-drained class, and the vadose zone (zone from land surface to the water table) being made predominantly of gravel. Additionally, there is not a laterally extensive low permeability unit that could retard downward movement to the water table. The water table is located about five (5) feet below land surface.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The Boise Cascade drinking water system consists of four wells that extract groundwater for domestic and commercial uses. The well system construction scores were moderate for the Power Plant Wells #1 and #2. The Regional Office well and the Plywood Plant well had a high construction score.

Power Plant Wells #1 and #2 had a 1996 sanitary survey showing compliance with well seal and flood protection standards. The two wells have ion exchange water treatment systems. Well logs were not available for the wells so a determination could not be made as to whether the casing and annular seals had been extended into low permeability units and whether current public water system (PWS) construction standards were being met.

The Regional Office well did not have a sanitary survey on file with the Southwest District Health Department, although there was a well log. The well log shows that the casing and annular seal do not extend into a low permeability unit. The well was drilled to 185 feet below ground surface (bgs). A well screen was installed from 175 feet bgs to 185 feet bgs. A surface seal was installed to a depth of 20 feet bgs. Blue clay was identified at 185 feet bgs. Though the well may have been in compliance with standards of the day, current PWS well construction standards are more stringent.

The Plywood Plant well has both a 1996 sanitary survey and a well log on file. The sanitary survey showed that the well was not in compliance because of a lack of an air vent. However, the well is protected from surface flooding by a cement pad and the casing being 8 inches above the pad. The well also has an ion exchange water treatment system. The well log also shows that the casing and annular seal extend to 25 feet bgs, but do not extend into a low permeability unit. The highest production zone in the well is less than 100 feet below the static water level of 5 feet bgs. No blue clay layer was identified. Though the Plywood Plant

well may have been in compliance with construction standards at the time it was built, current PWS well construction standards are more stringent.

The Idaho Department of Water Resources Well Construction Standards Rules (1993) require all PWSs to follow IDEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. Table 1 of the Recommended Standards for Water Works (1997) states that 8-inch steel casing requires a thickness of 0.322 inches and 6-inch casing requires a thickness of 0.288 inches, instead of the 0.250 inches that was used.

The well logs obtained for the Boise Cascade system show that the blue clay is encountered about 185 feet bgs. Both the Plywood Plant well and the Regional Office well are completed in the upper, unconfined aquifer. The Power Plant Wells #1 and #2 may be completed in either one of the aquifers, but a lack of information prevents IDEQ from making an accurate determination.

Potential Contaminant Source and Land Use

All four wells rated moderate for inorganic chemicals (IOCs) (ex. nitrates), synthetic organic chemicals (SOCs) (ex. pesticides), and volatile organic chemicals (VOCs) (ex. petroleum products). The wells rated low for microbial contaminants from a land use perspective. Commercial and industrial land uses in the delineated source area contributed the largest numbers of IOC, VOC, and SOC points to the contaminant inventory rating. The Payette River as well as the nearby industrial waste ponds could potentially contribute microbial contaminants.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. The Regional Office well had a total coliform bacteria detection in January 1995 and exceeded the MCL for lead in April 1998. The Plywood Plant well recorded total coliform bacteria in May 1994, and exceeded the MCL for lead and for copper in April 1998. The Power Plant wells have not had total coliform bacteria detections or exceeded regulatory levels for lead, copper, or any other inorganic contaminants. However, the exceedances for lead and copper were problems related to the distribution system and as such did not affect the susceptibility analysis.

High hydrologic sensitivity and/or system construction scores also weight final scores heavily. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and in Zone 2 also are major contributing factors. In terms of total susceptibility, the wells rate high for IOC, VOC, and SOC contamination. The Plywood Plant well and the Regional Office well also rate high for microbial contamination. The Power Plant wells rate moderate for microbial contamination.

Table 4. Summary of Boise Cascade Susceptibility Evaluation

Well	Susceptibility Scores									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Power Plant #1	H	M	M	M	L	M	H	H	H	M
Power Plant #2	H	M	M	M	L	M	H	H	H	M
Plywood Plant	H	M	M	M	L	H	H	H	H	H
Regional Office	H	M	M	M	L	M	H	H	H	H

H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

The threat of microbial contamination currently affects the Plywood Plant and Regional Office wells of the Boise Cascade drinking water system. The wells also showed a high susceptibility to IOC, VOC, and SOC contamination from nearby potential contaminant sources (Table 4).

The wells in the Boise Cascade system takes their water in whole or in part from the shallow, unconfined to semi-confined alluvial (river deposited material) aquifer, although the Power Plant wells may be completed in the deeper, semi-confined lacustrine (lakebed deposited) aquifer. The shallow aquifer has been demonstrated to be a distinct water-bearing unit in terms of water quality, water yield, and the sources of recharge (IDEQ, 2000). The shallow aquifer contains much higher levels of nitrate, lower levels of iron, and higher levels of arsenic than the deeper aquifer. Water yields from the shallow aquifer are significantly higher than from the deeper aquifer. Groundwater in the shallow aquifer is recharged primarily from surface water irrigation, direct precipitation, and canal leakage while the sources of recharge to the deeper aquifer are indeterminate but are very likely much older.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Boise Cascade, source water protection activities will vary depending on the specific well, though all should

focus on implementation of practices aimed at reducing the leaching of volatile organic contaminants, synthetic organic contaminants, inorganic contaminants, and microbial contaminants within the designated source water areas.

Most of the designated areas are outside the direct jurisdiction of the Boise Cascade. Partnerships with state and local agencies and industry groups should be established and are critical to success. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. All wells should maintain sanitary survey standards regarding wellhead protection. The Plywood Plant should continue to have bottled water on hand for drinking if the microbial contamination problems persist. Providing the Idaho Department of Environmental Quality with drillers' well logs for the Power Plant wells could help reduce the final well rankings since a lack of information caused these wells to have higher scores. If microbial contamination problems persist, continuous disinfection would reduce the risk of bacteriological contamination. Due to the time involved with the movement of groundwater, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Boise Regional IDEQ Office (208) 373-0550

State IDEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 743-6142 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Division of Environmental Quality, 1994. Ground Water and Soils Reconnaissance of the Lower Payette Area, Payette County, Idaho. Ground Water Quality Technical Report No. 5. Idaho Division of Environmental Quality. December 1994.

Idaho Division of Environmental Quality, 1996. Lower Payette River Agriculture Irrigation Water Return Study and Ground Water Evaluation, Payette County, Idaho. Water Quality Status Report No. 115.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Environmental Quality, 2000. City of Fruitland Wellhead Viability Project 319 Grant Final Report July 2000.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

Boise Cascade
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : BOISE CASCADE POWER PLANT Well# : WELL 1 (NEWER)

Public Water System Number 3230003 09/06/2000 12:12:35 PM

1. System Construction		SCORE				
Drill Date						
Driller Log Available	NO					
Sanitary Survey (if yes, indicate date of last survey)	YES	1996				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		4				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		6				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2	
Farm chemical use high	NO	0	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	12	33	29	1	
(Score = # Sources X 2) 8 Points Maximum		8	8	8	2	
Sources of Class II or III leacheable contaminants or	YES	4	11	11		
4 Points Maximum		4	4	4		
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0	
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	12	12	2	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	0	1	1		
Land Use Zone II	Less than 25% Agricultural Land	0	0	0		
Potential Contaminant Source / Land Use Score - Zone II		2	3	3	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0	
Cumulative Potential Contaminant / Land Use Score		18	19	19	4	
4. Final Susceptibility Source Score		14	14	14	12	
5. Final Well Ranking		High	High	High	Moderate	

Ground Water Susceptibility Report Public Water System Name : BOISE CASCADE POWER PLANT Well# : WELL 2(OLDER W)

Public Water System Number 3230003 09/06/2000 12:12:49 PM

1. System Construction		SCORE			
Drill Date					
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	1996			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	12	33	29	1
(Score = # Sources X 2) 8 Points Maximum		8	8	8	2
Sources of Class II or III leacheable contaminants or	YES	4	11	11	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	12	12	2
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	0	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		2	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		18	19	19	4
4. Final Susceptibility Source Score		14	14	14	12
5. Final Well Ranking		High	High	High	Moderate

Ground Water Susceptibility Report Public Water System Name : BOISE CASCADE PLYWOOD PLANT Well# : WELL 1

Public Water System Number 3230051 09/06/2000 12:12:05 PM

1. System Construction		SCORE				
Drill Date	03/13/1987					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1996				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		5				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		6				
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2	
Farm chemical use high	NO	0	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO	YES	
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	4	5	8	2	
(Score = # Sources X 2) 8 Points Maximum		8	8	8	4	
Sources of Class II or III leacheable contaminants or	YES	4	2	0		
4 Points Maximum		4	2	0		
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0	
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	10	8	4	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	1	0		
Land Use Zone II	Less than 25% Agricultural Land	0	0	0		
Potential Contaminant Source / Land Use Score - Zone II		3	3	2	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	0	0		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1		
Total Potential Contaminant Source / Land Use Score - Zone III		3	1	1	0	
Cumulative Potential Contaminant / Land Use Score		20	16	13	6	
4. Final Susceptibility Source Score		15	14	14	13	
5. Final Well Ranking		High	High	High	High	

Ground Water Susceptibility Report Public Water System Name : BOISE CASCADE REGIONAL OFFICE Well# : WELL 1

Public Water System Number 3230071 09/06/2000 12:11:49 PM

1. System Construction			SCORE			
Drill Date		09/04/1969				
Driller Log Available		YES				
Sanitary Survey (if yes, indicate date of last survey)		NO	0			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		NO	1			
Casing and annular seal extend to low permeability unit		NO	2			
Highest production 100 feet below static water level		YES	0			
Well located outside the 100 year flood plain		NO	1			
Total System Construction Score			5			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		NO	2			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		NO	2			
Total Hydrologic Score			6			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A		URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high		NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A		YES	NO	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A			2	2	2	2
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		YES	4	8	6	1
(Score = # Sources X 2) 8 Points Maximum			8	8	8	2
Sources of Class II or III leacheable contaminants or		YES	1	3	0	
4 Points Maximum			1	3	0	
Zone 1B contains or intercepts a Group 1 Area		NO	0	0	0	0
Land use Zone 1B		Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B			9	11	8	2
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		YES	2	2	2	
Sources of Class II or III leacheable contaminants or		YES	0	1	0	
Land Use Zone II		Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II			2	3	2	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		YES	1	0	0	
Is there irrigated agricultural lands that occupy > 50% of		YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III			2	1	1	0
Cumulative Potential Contaminant / Land Use Score			15	17	13	4
4. Final Susceptibility Source Score			14	14	14	13
5. Final Well Ranking			High	High	High	High